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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/683,185	11/29/2001	Albert Rabinovich	EH-10417	1030

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SUITE 1201  
NEW HAVEN, CT 06510-2802

EXAMINER
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YEE, DEBORAH

ART UNIT	PAPER NUMBER
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1742

DATE MAILED: 07/25/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/683,185

Applicant(s)

ALBERT RABINOVICH ET AL

Examiner

Deborah Yee

Art Unit

1742

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 23 February 2005 and 11 April 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1 to 3, 5 to 10 and 12 to 41 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1 to 3, 5 to 10 and 12 to 41 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)             | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)    | Paper No(s)/Mail Date. _____  |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____   | 6) <input type="checkbox"/> Other: _____                                    |

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## **DETAILED ACTION**

### ***Continued Examination Under 37 CFR 1.114***

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 2-23-05 has been entered.

### ***Response to Arguments***

2. Applicant's arguments with respect to claims 1 to 3, 5 to 10 and 12 to 41 have been considered but are moot in view of the new ground(s) of rejection.

### ***Claim Rejections - 35 USC § 103***

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

1. Claims 1 to 3, 5 to 10, and 12 to 41 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wunning (US Patent 5,452,882) in view of Bunge (US Patent 6,394,793) and Berg (US Patent 4,767,473).

2. Wunning on lines 25 to 55 of column 2 and lines 1 to 15 of column 4 discloses a method of quenching a metallic work piece by impingement gas fluid cooling at

quenching intensity equivalent to or greater than water or oil . Moreover, Wunning on lines 15 to 20 of column 4 and lines 12 to 22 of column 14 teaches that its impingement cooling rate can be localized and varied at different regions of a metallic work piece surface depending on desired properties and shape and uniformity of said work piece. Even though Wunning does not specifically teach subjecting work piece in one section at a faster cooling rate than another section as recited by claims 1 and 31 or subjecting work piece to impingement cooling in one cooling section to further minimize a differential with another cooling section as recited by claim 8 , such would not be a patentable difference since variable cooling techniques to promote uniformity or variation in physical properties are well known and conventional in the art as evident by Berg and Bunge and hence would be obvious to incorporate when using cooling method of Wunning which also already teach variable and localized cooling rates.

3. Also Wunning on lines 21 to 32 of column 3 discloses using a cooling fluid comprising gas and lines 42 to 67 of column 4 discloses controlling intensity of cooling by controlling the velocity (constant or varies) and/or pressure of the impinging gas jets to produce uniform cooling which would meet the process limitations of one or more of the dependent claims.

4. Wunning in Claim 1 of columns 14-15 and example in column 12 disclose an apparatus for quenching a material comprising a support for receiving the material; and an outlet having a size and a location adjacent said support such that a fluid exiting said outlet impingement cools the material . Even though Wunning does not specifically teach impingement cooling as a subset of forced convection cooling that produces a

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significantly higher heat transfer coefficient than the remainder of the force convection regime, such variable cooling rates would be obvious for the reasons set forth in paragraph 2 of the office action.

5. In regard to apparatus, note example in column 12 on lines 45 to 60 has a nozzle diameter ( $d$ ) = 2 mm and a distance  $Z$  from the material placed in the support of 10mm. The ratio  $Z/d = 5$  and is within the claimed range of 1 to 6 recited by claim 16. Also the prior art outlet has a diameter ( $d$ ) of 2 mm and the adjacent outlet spacing( $s$ ) is 10mm, such that the ratio  $s/d = 5$  and is within the claimed range of less than 26 recited by claim 17.

6. Even though the circumferential space  $X$  and the radial spacing ( $Y$ ) recited by claims 18 and 19 are not taught by prior art, such would be expected since similar high intensity cooling rates are achieved, and in absence of proof to the contrary.

7. Prior art apparatus in figures 3 and 4 also comprises a plurality of outlets in an annular pipe and hence meets claim 20.

8. Prior art on line 55 of column 8 discloses a nozzle diameter range of 05 to 10 mm (equivalent to 0.0197 to 0.393") and specific prior art nozzle example on lines 45 to 55 of column 12 teaches a diameter of 2 mm (equivalent to 0.0787") and is closely within applicant's claimed range of 0.055 to 0.075 inches recited in claims 39 to 41

9. Even though heat transfers of up to 300BTU/hrft<sup>2</sup> recited by dependent claims are not disclosed by Wunning, such would be expected since cooling rate can be higher than oil quenching.

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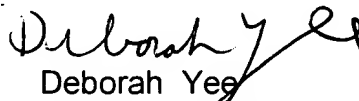
10. Wunning on lines 54 to 68 of column 3 teaches method for quenching metal work piece with any particular shape and hence would encompass shapes comprising higher and lower volumetric sections as recited by one or more of the dependent claims.

11. Wunning method teaches cooling a metallic workpiece and hence would broadly encompass the Ni alloy recited by claim 37.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Deborah Yee whose telephone number is 571-272-1253. The examiner can normally be reached on Monday-Friday from 6:00 to 2:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Roy King can be reached on 571-272-1244. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

  
Deborah Yee  
Primary Examiner  
Art Unit 1742

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